efficiency and more scientific knowledge of the principles underlying the various phases of forest administration, and these demands are being met as far as the limited funds permit.—GEO. D. FULLER.

Parasitic fungi of Wisconsin.—DAVIS[51] has brought together in a single list the parasitic fungi of Wisconsin reported in a succession of previous lists, beginning with that of A. F. BUNDY, published in the Report of the Geological Survey issued in 1873–1879, and including 30 species. The next list was that of TRELEASE (1884), and since then DAVIS has been indefatigable in adding species which justified the publication at intervals of supplementary lists. The final list contains 825 species of parasitic fungi and about 750 hosts. The Phycomycetes are represented by 61 species, 24 of which belong to *Peronospora*. The Ascomycetes number 502 species, the largest genus being *Septoria*, with 121 species. The Basidiomycetes number 256 species, all but 6 of which are smuts and rusts.—J. M. C.

Sand dune plants.—In a study of the flora of some sand dunes near the sea between Redonda and Venice, California, COUCH,[52] has made a floristic census of a number of quadrats, showing that in this area *Gaertneria bipinnatifida* is the dominant pioneer plant, but as the succession advances with increasing stability of the substratum, it is succeeded by *Abronia umbellata*, which is closely followed by *Eriogonum parvifolium*, *Adenostoma fasciculatum*, *Cheiranthus suffrutescens*, and *Lupinus Chamissonis*. Attention is also directed to the two kinds of competition here evident, that between the plants and their environment, and that between the plants themselves.—GEO. D. FULLER.

Antagonistic symbiosis in lichens.—TREBOUX'[53] studies of *Cystococcus humicola*, an alga that occurs free in nature and also in symbiosis with lichen fungi, lead him to the view that the lichen fungus is essentially parasitic. He concludes that the physiology of this alga is the same, whether inside or outside of a fungal symbiont; it does not require protein food (peptone) in either case, but can secure its nitrogen from nitrates or ammonium salts. Among the points in favor of the theory of parasitism are the smaller size of the symbiotic algae as compared with the free algae, less frequent cell division, diseased aspect where in contact with haustoria, and the relative absence of pyrenoid starch.—H. C. COWLES.

---

[51] DAVIS, J. J., A provisional list of the parasitic fungi of Wisconsin. Trans. Wis. Acad. Sci. **17**:846–984. 1914.

[52] COUCH, E. B., Notes on the ecology of sand dune plants. Plant World **17**:204–209. 1914.

[53] TREBOUX, O., Die freilebende Alge und die Gonidie *Cystococcus humicola* in Bezug auf die Flechtensymbiose. Ber. Deutsch. Bot. Gesells. **30**:69–80. 1912.